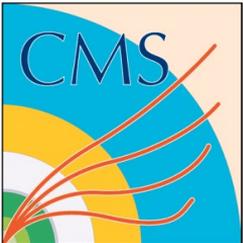# University of Kansas Postdoc or Research Associate Search

- Posting open at employment.ku.edu/staff/17804BR
- Applications due with Initial Review date: Oct. 15, 2020
- Estimated Start Date: Jan 2021
- Duties:

  Physics Analysis fitting in with current group efforts around BSM
  including current compressed SUSY search
  Detector operation and development with Tracker group
  Interacting with and mentoring students

- Location either at KU or at CERN

University of Kansas CMS HEP group
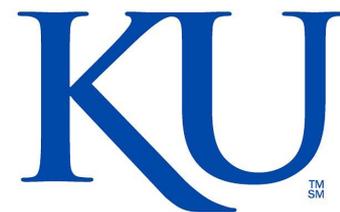
Professors: Alice Bean

Graham Wilson

Chris Rogan

Postdoc/Research Assoc will be
supervised by either Bean or Wilson
supported through their NSF grant

Current postdocs:
  Sadia Khalil (KU) sup. by Bean (leaving July 2021)
  Nicola Minafra (CERN) sup. by Rogan
  Anna Kropivnitskaya (CERN) leaving Oct 2020
 Previous postdoc:
    Devdatta Majumder (CERN) sup. by Wilson
Graduate Students:
  Erich Schmitz – PhD expected 2020   (Bean)
  Justin Anguiano – PhD expected 2021 (Wilson)
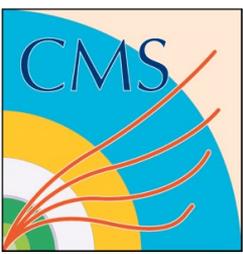 Jack King, Andres Abreu, Margaret Lazarovitz,
    Zach Flowers   (Rogan)
Undergraduate students: currently 3 with Bean
Electrical Engineer: Rob Young
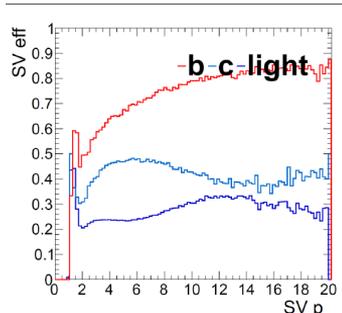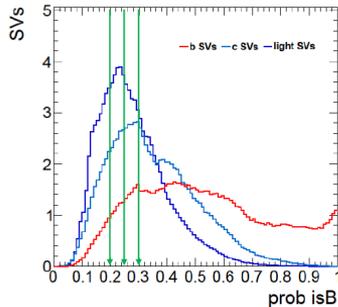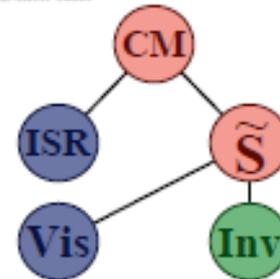Electronics Technician: Bill Burley

KU group Analysis

● Currently – Compressed SUSY search

Entire group works on this extensive analysis studying the EWkino sector

- Expand to less restrictive model assumptions
- Recursive Jigsaw Recon.
- Currently using ISR events
- Studying low pt b-tagging with new NN SV tagger
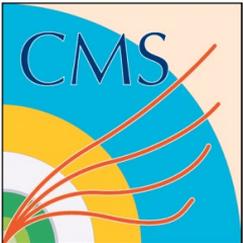- Studying low pt lepton tagging
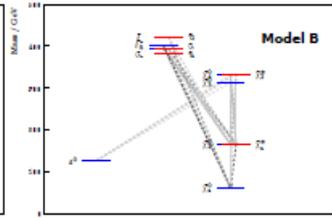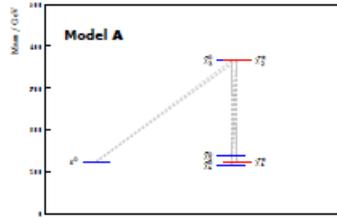
● Previous Analysis: Search for t' Vector Like Quarks in the fully hadronic mode (tH, tZ)
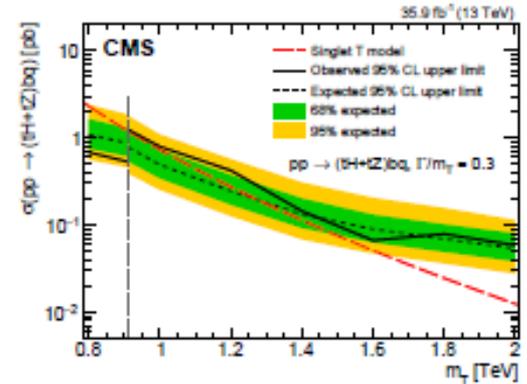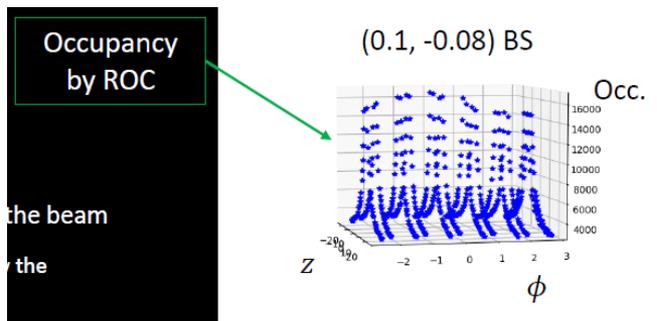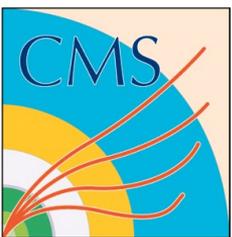
Tracker work with KU group

- HL-LHC pixel detector e-links (next slide)
- Material Mapping Studies (slide 6)
- Operations
    DCS and shifts
- DPG
    Tracking independent beamspot
    Bad pixel Database lists
    Pixel cluster charge plots
    ?

- Previously helped to build the Phase I pixel tracker and X-ray tested ~300 FPIX modules

Occupancy by ROC

(0.1, -0.08) BS
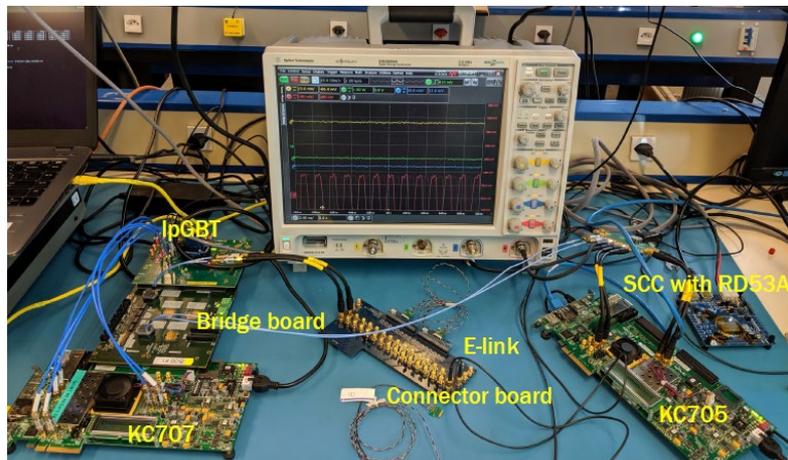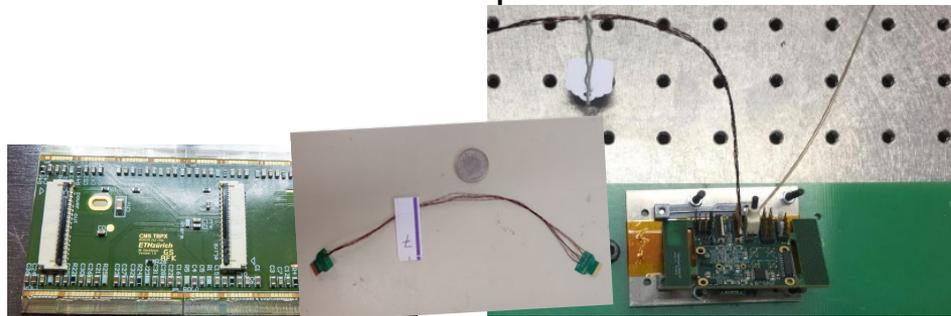
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KU project: Electronic Links for HL-LHC pixel detector
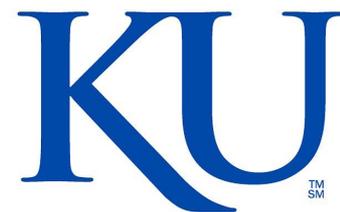
Low mass cables that carry electronic signals from the readout chip on the module to a low power gigabit optical transceiver readout at 1.28 Gbps
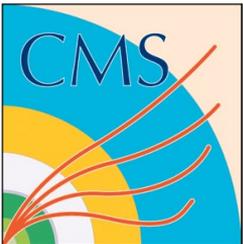

Module   Twisted Pair Cables   Port Card with fiber

KU in charge of Design, Manufacture and Testing for CMS

Postdoc could help to lead this effort

Test setup at CERN
Similar setups are at KU

Material Mapping Studies

- Group previously worked on mapping tracker material using Nuclear Interactions
- Now have expanded these studies to photon conversions

- Want to add studies with for example $Z\gamma$ with $Z \rightarrow \mu+\mu-$ and di-muon processes
- Need studies with HLT trigger
- Postdoc could work on HLT tracking developments

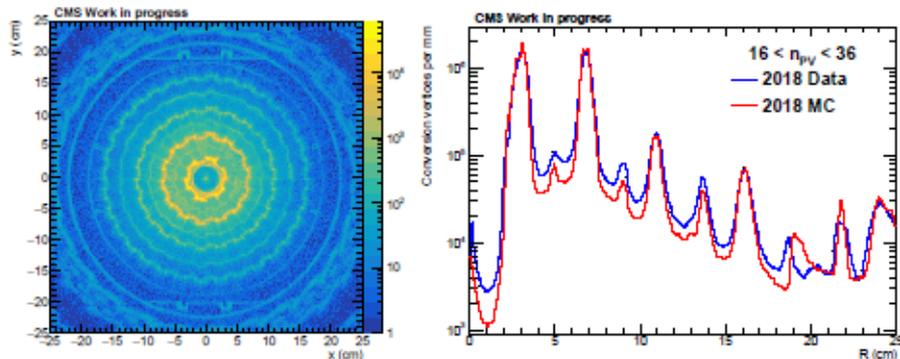 - This work can include work to leverage heterogeneous computing with GPUs

Figure 6: Left: Reconstructed conversion vertices in 2018 data. Right: Radial distribution of the vertices in 2018 data events (blue) compared with detector simulation (red), normalized to the same number of primary vertices.