Introduction to the Postdoc Opening at the Catholic University of America (CUA)

Link: https://inspirehep.net/jobs/2802207

Shin-Shan Yu

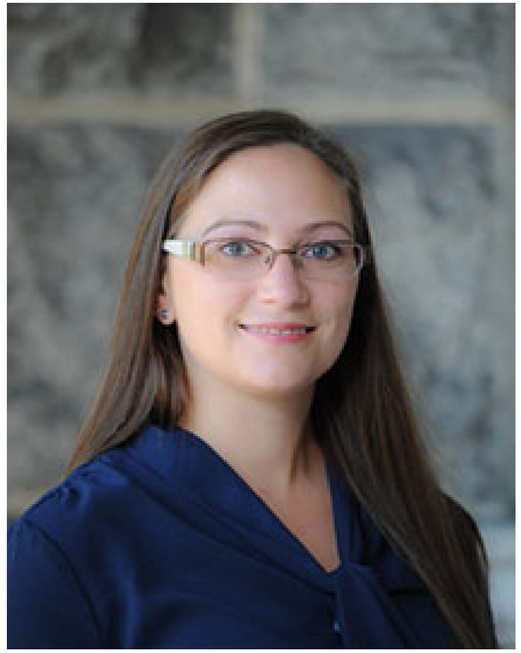
LHC Job Matching Event, 27 November 2024

The Catholic University of America

- Founded in 1887, Dept. of Physics founded in 1958
- Located in Washington DC, U.S.A.
  - Metro stop at Brookland-CUA is about 8 minutes walk from the Dept. of Physics
  - 46 mins from Ronald Reagan Washington National Airport (DCA)
  - 1h 26 mins from Dulles International Airport (IAD) that has direct flights to the Geneva Airport

The Catholic-HEP Group

Aaron Dominguez

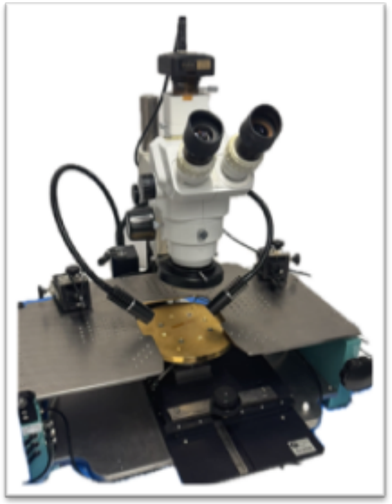


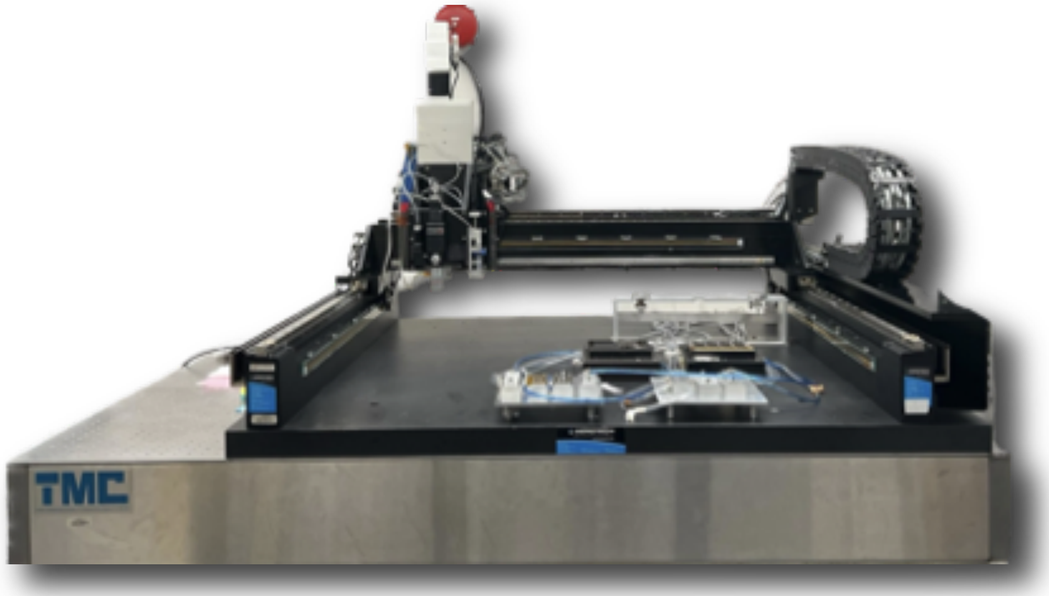
Rachel Bartek

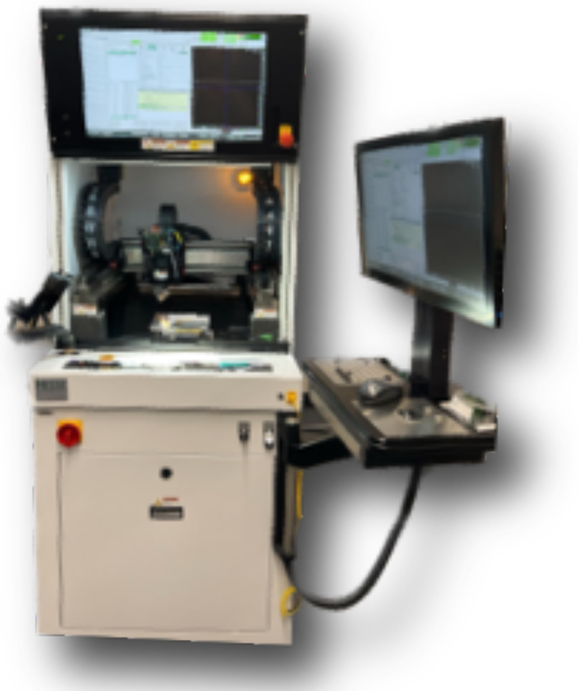
Shin-Shan Eiko Yu

- 3 PIs, 1 postdoc (Ali Eren Simsek), 2 graduate students, and 1 lab manager
- Designed, commissioned, and operated (-ing) Phase 0 and Phase 1 pixel detectors
- One of the four pixel module assembly centers for the CMS Phase 2 upgrade

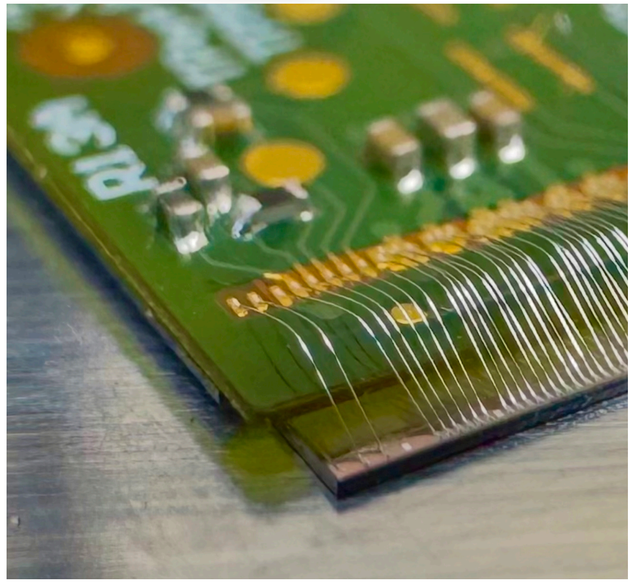
Pixel Module Assembly





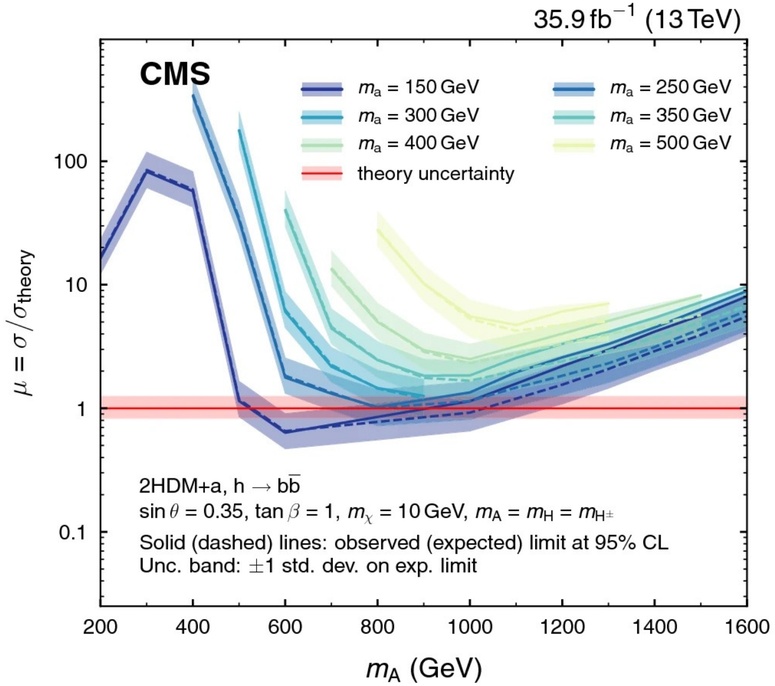


- Iso 8 Cleanroom (class 100,000)
- Microscope Inspection of the sensor+ROC module - Glue HDI (high-density interconnect) together with the bare module - wire bond the HDI to the ROC side
- Goal: 40+ modules per week, 5 modules at one time

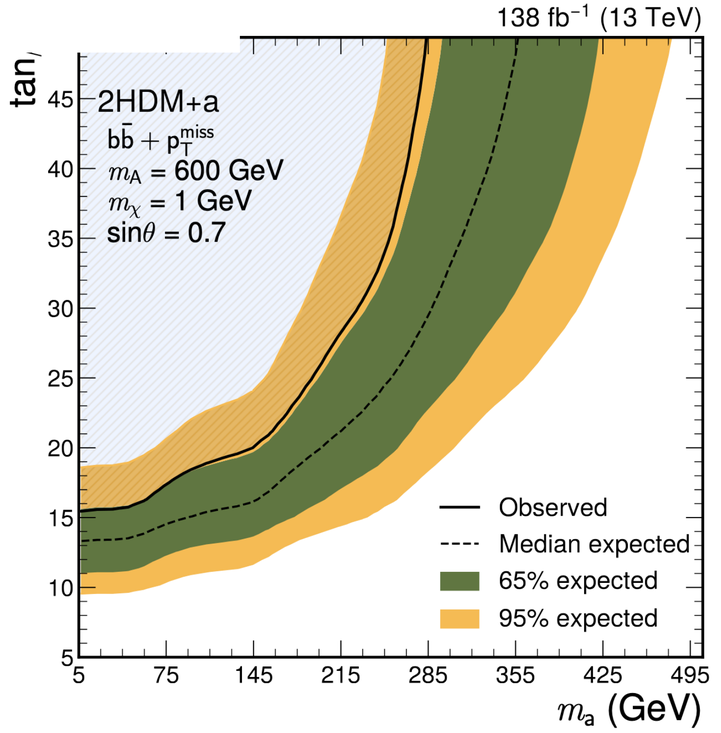


Physics Analysis

- Previous analyses
  - Mono-higgs (bb), mono-bb, mono-top
- Ongoing analyses
  - Run 2 Di-jet resonance search with calorimetric scouting
  - Run 3 Di-jet resonance search with PF scouting
  - Run 3 X-> YH resonance search in bbγγ



https://arxiv.org/abs/2408.17336



Postdoc Position Opening

- Open until filled, contract renewed on a yearly basis
- Based at CUA with trips to CERN/FNAL, strong support from CUA for leadership
- Hardware
  - Familiarized with the procedure of pixel module assembly and supervise the production
  - R&D project for the future FCC-ee dual readout calorimeters
    - Crystal characterization/investigation of low-cost material
- Physics analysis
  - Extension of Run 3 X-> YH resonance search in bbγγ to the mass region unexplored in Run 2
  - DM searches in HH+MET events