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# Two postdoctoral positions

Inspire ad: <https://inspirehep.net/jobs/2849765>

Hannah Arnold, Valerio Dao

LHC Job Matching Event

November 27, 2024



Stony Brook  
University



# Introduction



Hannah Arnold



Valerio Dao

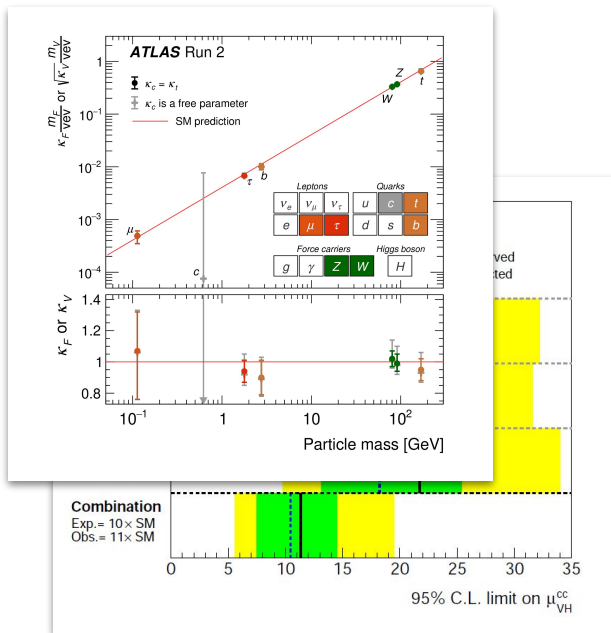
Since Jan 2024, we are Assistant Professors in the ATLAS group of Stony Brook University and building our teams

⇒ **2 open postdoc positions**

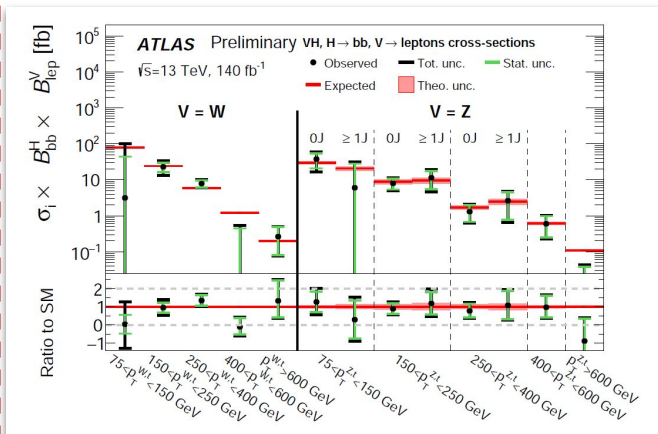


# Our 'main' physics program (recent results)

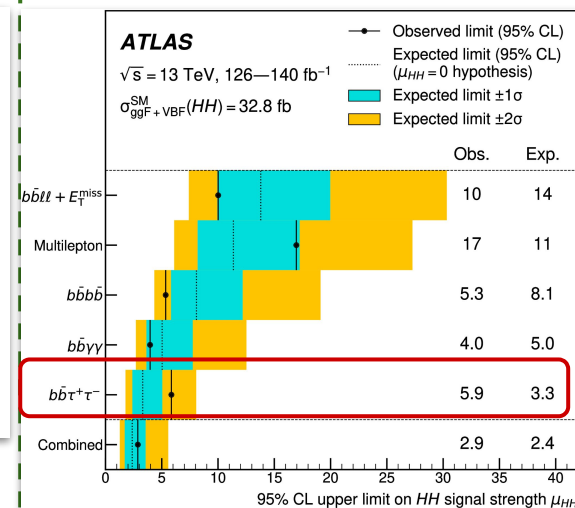
## Higgs-charm coupling & fermion-mass puzzle



## $H \rightarrow bb, V\bar{H}$ cross-sections & anomalous couplings (EFT)



## Higgs self-coupling



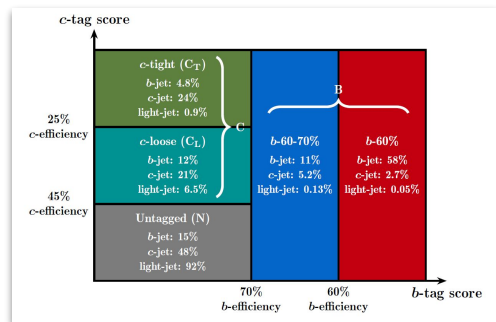
Dao

$\Rightarrow$  Final states with pairs of heavy-quark jets,  $H \rightarrow bb/cc$  and leptons (from  $W, Z, H$ ), resolved and boosted

Arnold

# Other interests

## Flavour tagging



Physics modelling / simulation / ...

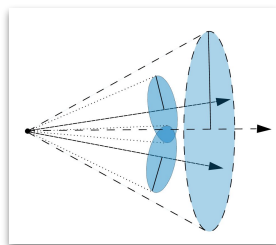


Software frameworks

Combinations & interpretations (EFT)

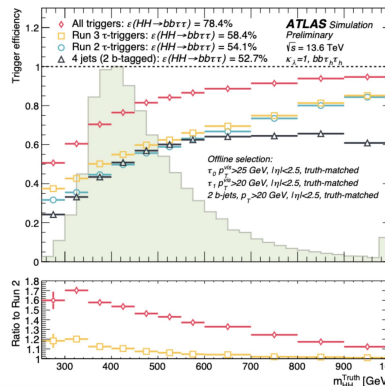
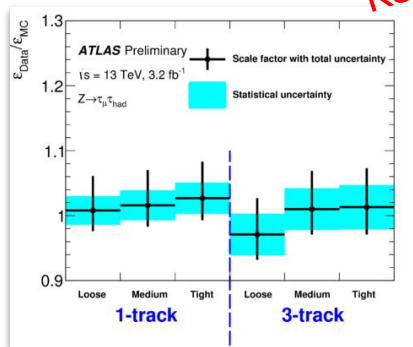
Machine Learning

Jets\*



## $\tau$ -lepton ID

Recent



Statistics (tools)

Trigger

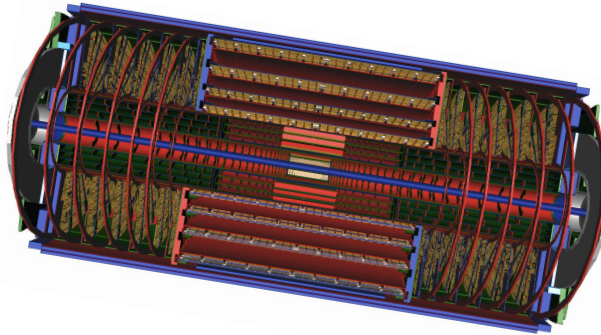
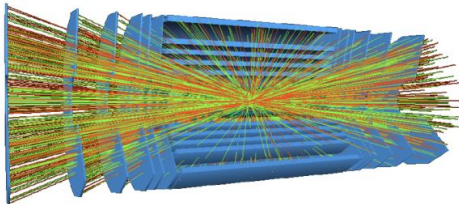
\*No previous involvement

# Detector development / upgrade

⇒ Dao (Tschebychev, Piacquadio): module testing and DAQ development for InnerTrack upgrade (ITk)

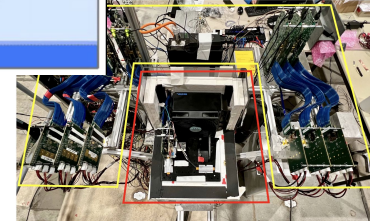
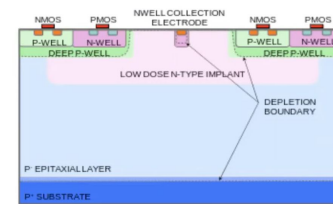
⇒ Dao: R&D for monolithic pixel detectors for future colliders (detector characterisation, testbeam)

“Phase II”: full inner detector replacement (Pixel+Strip)



## High Luminosity LHC (HL-LHC)

In the next years need to scale operations from few modules to full detector (~9400 modules)



⇒ Also in the group: LAr Detector operation and electronics upgrade for HL-LHC

# ATLAS @ SBU

## The group (part of HEP collider)

5 faculty

2 research staff

4 postdocs

8 grad/MSc students

4 undergrad students

+ 1 emeritus, + heavy ions group

+ 2 postdocs from 2025!

+  $\geq x$  students?

## Activities

+ other (B)SM (Di-)Higgs studies

+ LAr calorimeter operations & upgrade



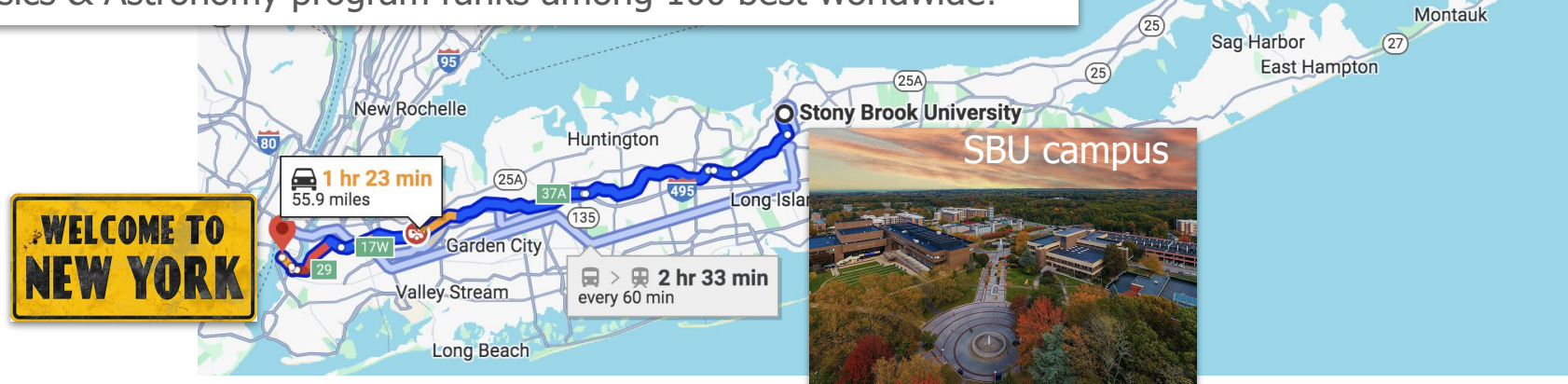
# SBU on Long Island



Stony Brook University is the flagship of the **State University of New York**

## Stony Brook Physics & Astronomy Department

- Large (~ 70) & very international faculty body
- HEP collider & neutrino, nuclear, AMO, CM,...
  - strong theory group (C.N. Yang Institute for Theoretical Physics)
- Close connection to Brookhaven National Lab (incl. adjunct faculty)
- Physics & Astronomy program ranks among 100 best worldwide!



# The positions



- Postdoctoral researcher in the Arnold or Dao group, respectively
- Job description:
  - Main focus: leading single Higgs or di-Higgs analyses in final states with heavy-quark jets and leptons:
    - Arnold:  $H \rightarrow cc$  in  $ttH$  and  $VH$  production
    - Dao:  $HH \rightarrow bb\tau\tau$
    - Other analysis involvements depending on capacity/interest/timeline/...
  - In addition: combined performance, detector upgrade, operations,... etc. depending on interest/expertise/analysis needs/...
    - Dao: silicon detectors / ITk
  - Part of the job: daily supervision of several (under)grad students
- Contract: 3 years (up to 5 years if funding available)
- Preferentially based at SBU
- Frequent travel and extended stay(s) at CERN possible
- Start date: ASAP, but negotiable