

# CMS HCAL Phase I & II TB Summary

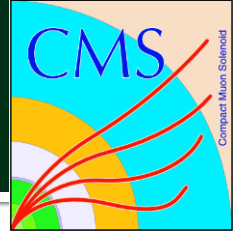
Joe Pastika on behalf of CMS HCAL



**BAYLOR**  
UNIVERSITY



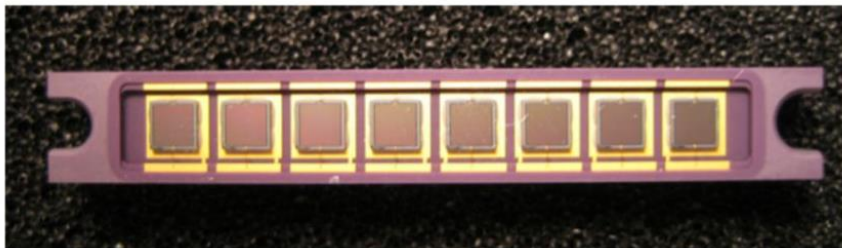
# CMS HCAL Phase 1 upgrade setup



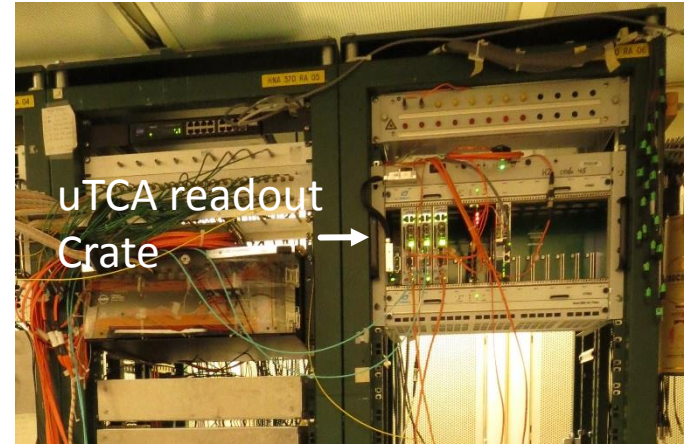
HE Wedge

HCAL Table

SiPM Array

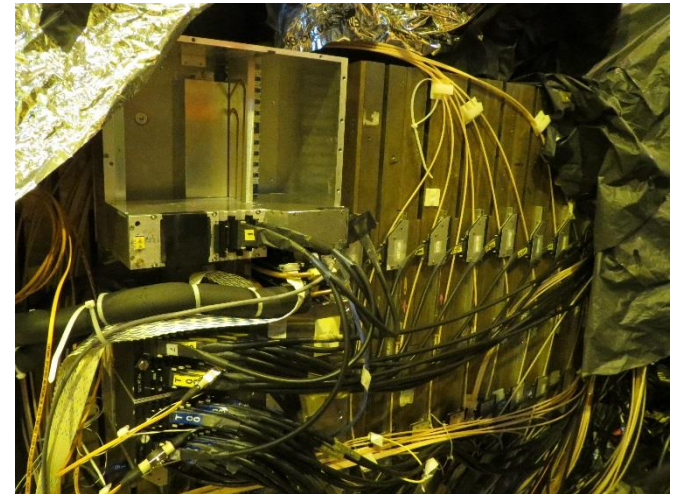


Backend Electronics



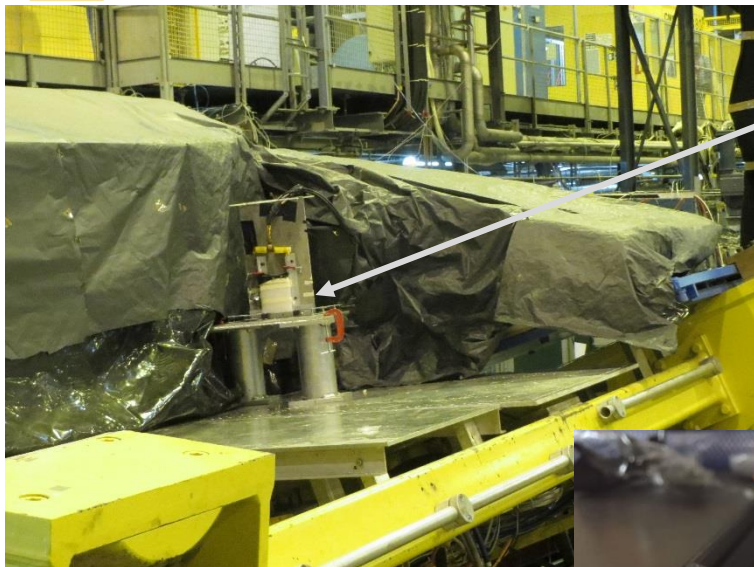
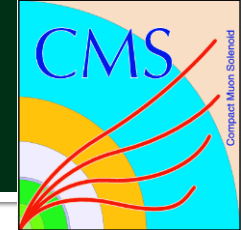
uTCA readout  
Crate

Frontend Electronics

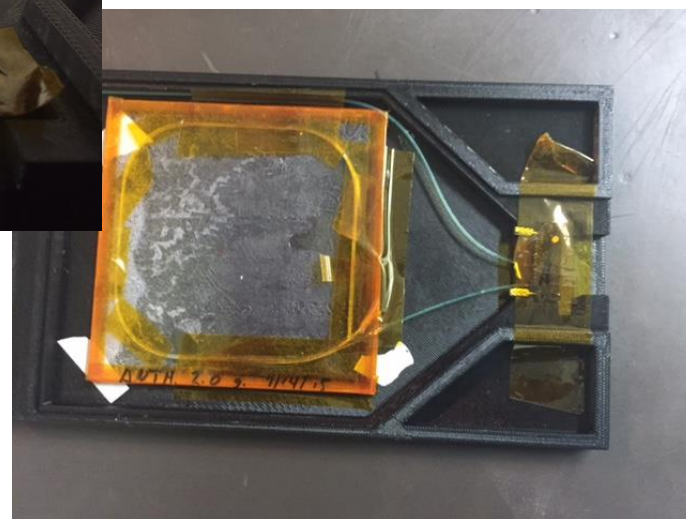
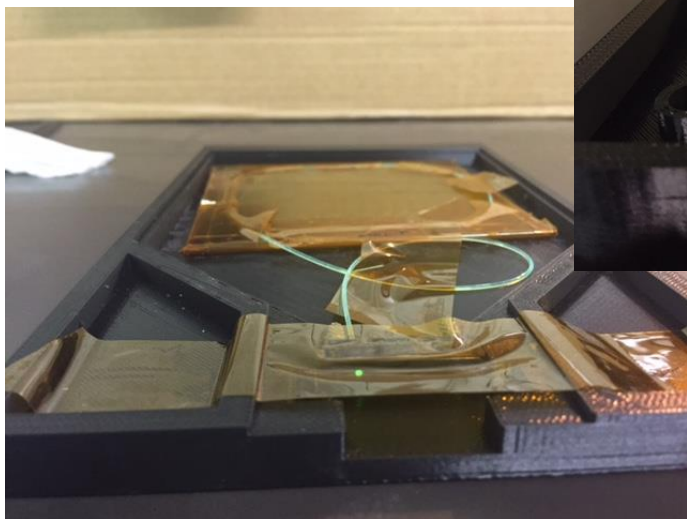
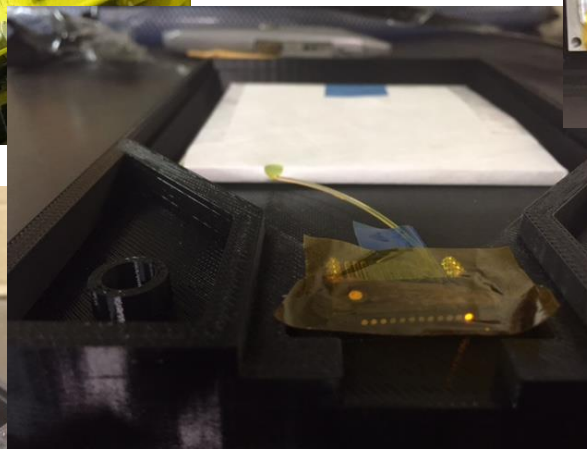
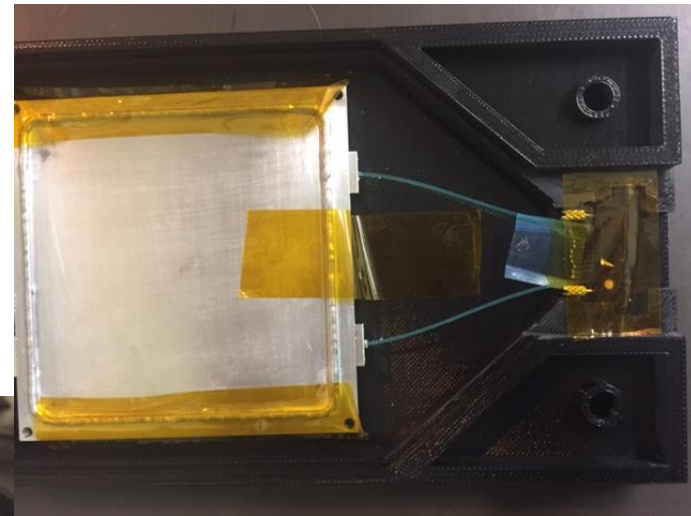




# Phase II Upgrade Setup

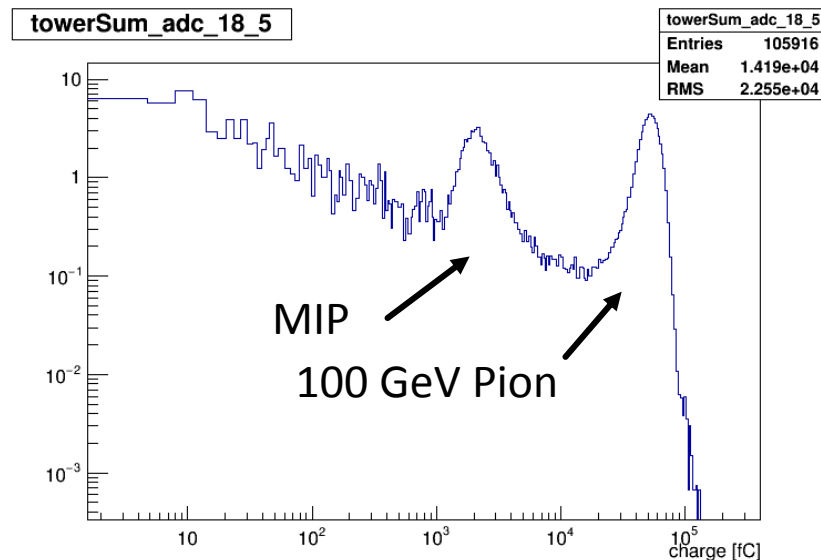


Phase II tiles  
Placed here



## ■ Phase I data

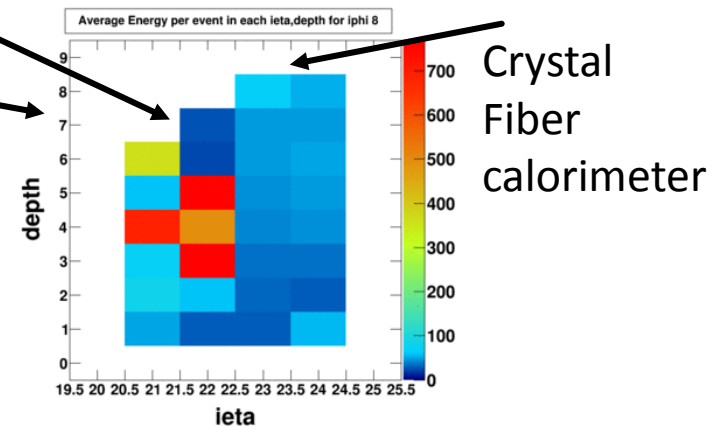
- 150 GeV Muon scans
  - Confirm detector mapping
  - Perform MIP Calibration
- Pion energy scans
  - 30 to 300 GeV
  - Study energy resolution, timing, and shower development



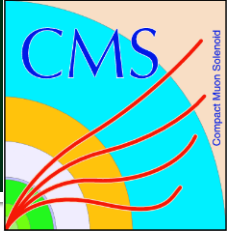
## ■ Phase II data

- 150 GeV Muons
  - Scan scintillator samples with muons to derive overall light yield as well as light collection efficiency as a function of position on each tile

Standalone tiles



# Special Thanks to



- Henric Wilkens
- Bastian Rae
- Adrian Fabich
- Michael Jeckel
- David Jaillet
- Maurici Galofré-Vilà
- Bruno Pichler
- Dragoslav Lazic
- The whole machine department