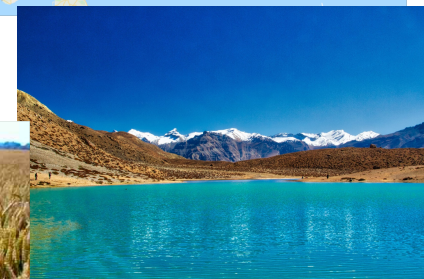


# $H \rightarrow WW^* \rightarrow e\nu\mu\nu$ and ATLAS Tracker Upgrade

Ruchi Gupta

# About Me

- I grew up in northern part of India (Punjab)
- **2010-2015** : PhD at Panjab University, Chandigarh and SINP, Kolkata
  - Measurement of multijet events in pp collisions at  $\sqrt{s}=7$  TeV in the CMS experiment.
  - Measurement of single particle calorimetric response using minimum bias events in pp collisions.
- **2015-2018** : Posdoctoral position with SMU, Dallas
  - *Joined the ATLAS Collaboration !!*
  - Measurement of higgs production cross sections in  $H \rightarrow WW^* \rightarrow e\nu\mu\nu$  in pp collisions at  $\sqrt{s}=13$  TeV
  - Development and maintenance of b-tagging triggers in ATLAS.



# My current work

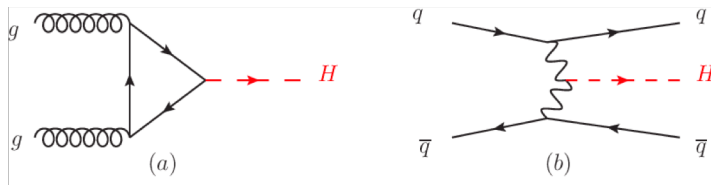
## ATLAS @ DESY

- June, 2018 : Started as DESY Fellow in the ATLAS experiment
  - Measurement of  **$Z\gamma \rightarrow l^+l^-\gamma$  production cross-section** in pp collisions at  $\sqrt{s}=13$  TeV
    - Ongoing Analysis
  - **ATLAS tracker upgrade (ITK) :**
    - Endcap Strip tracker for HL-LHC
    - Electronic tests for hybrids and modules (smallest structural unit with Si sensor and ASICs)

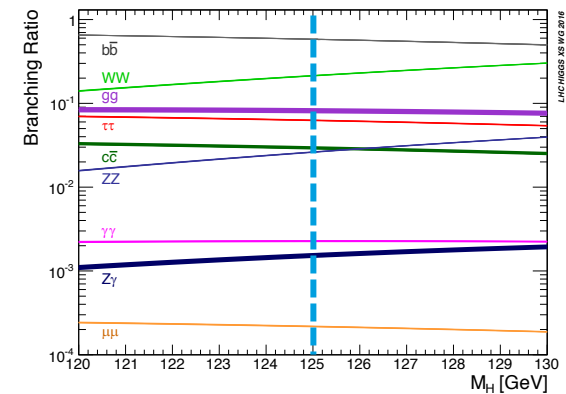
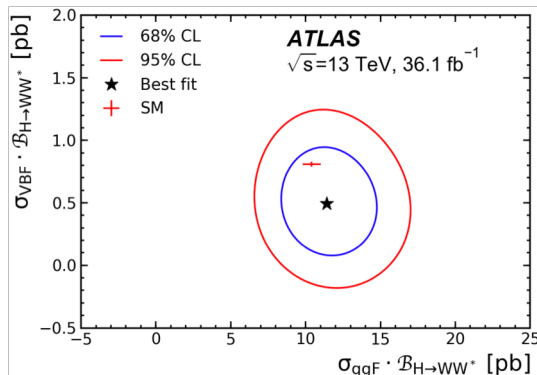
# $H \rightarrow WW^* \rightarrow e\nu\mu\nu$

## My Recent Work

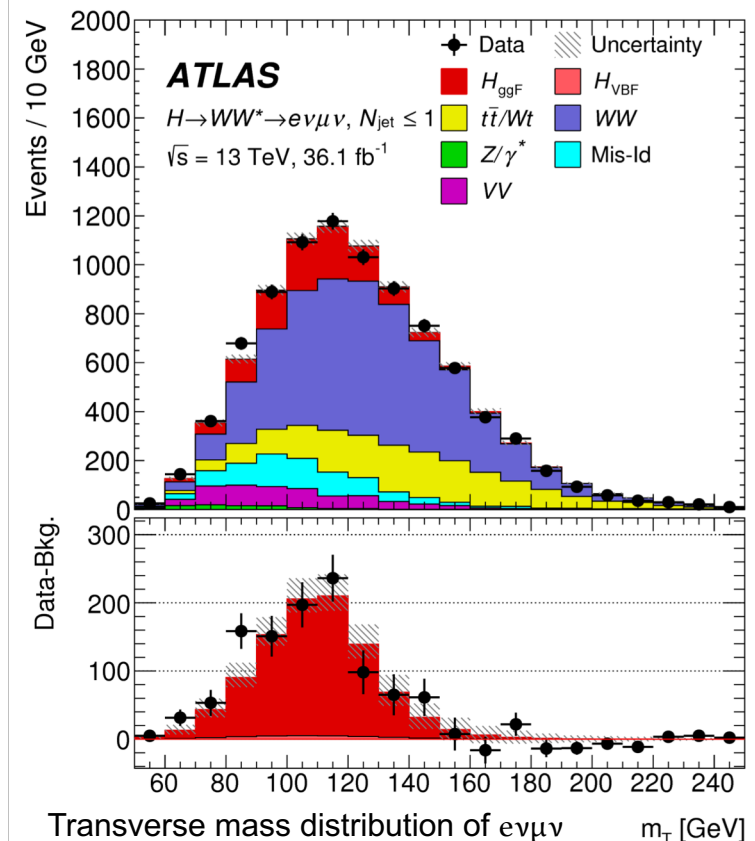
- Higgs production cross section measurement for gluon-gluon fusion and vector boson fusion processes.



- Large number of higgs events observed – high cross section of  $H \rightarrow WW^*$
- Large amount of irreducible background



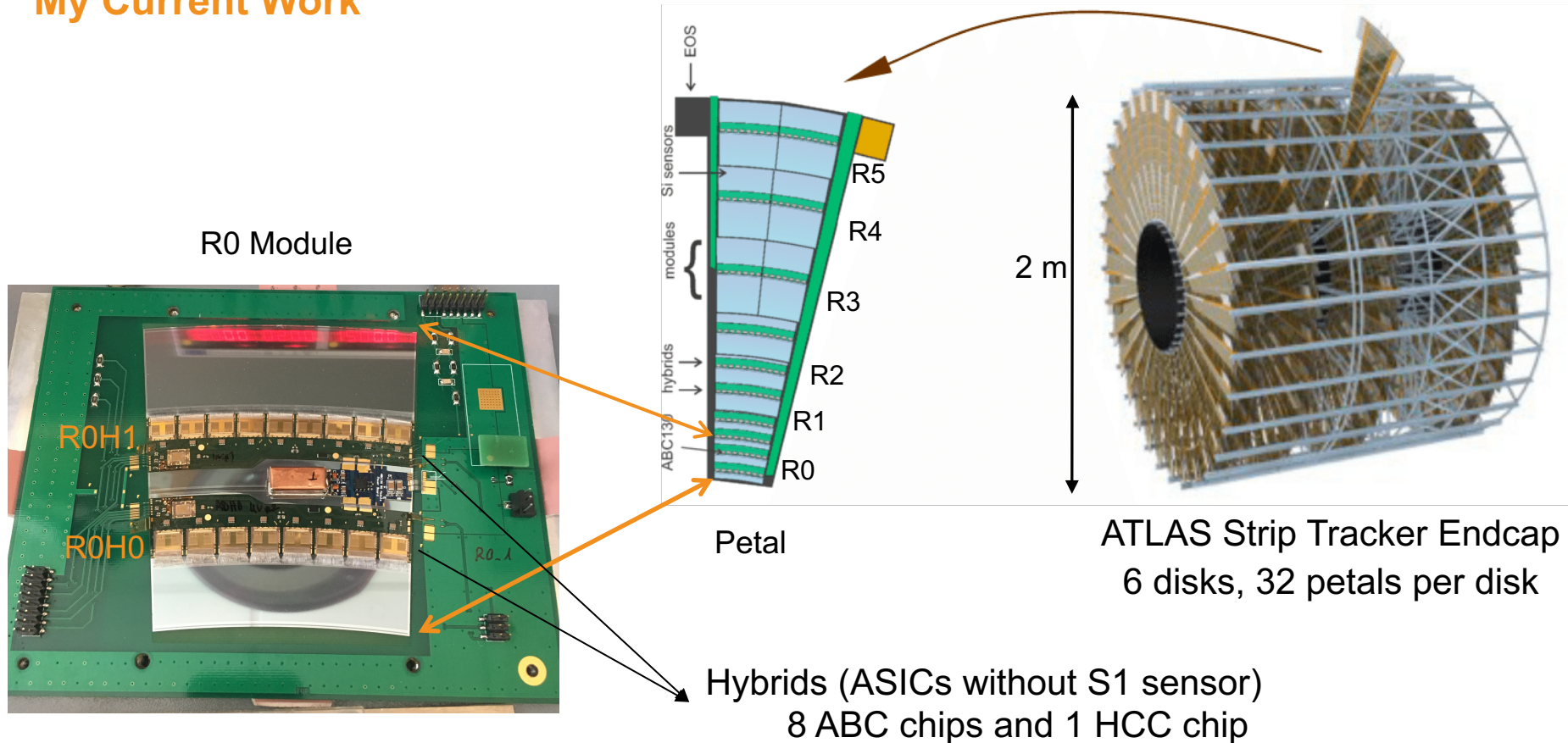
*Phys. Lett. B 789 (2019) 508-529*





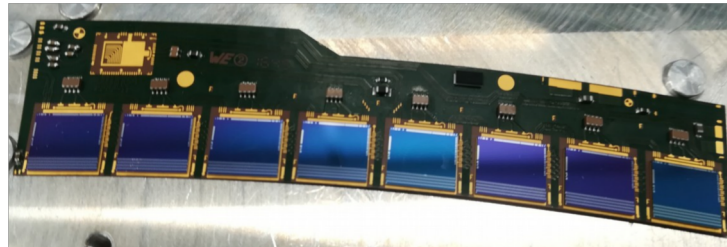
# ATLAS Strip tracker Upgrade

## My Current Work



**ABC chip** : converts incoming charge signal into hit information. Reads 256 strips of the Si strip detector.

**HCC chip** : Hybrid Controller Chip, interface between ABC chip and the bus tape



# ATLAS Strip tracker Upgrade

## My Current Work

- Development of various tests for hybrids and modules
- New and growing setup in DAF
- Optimization of gluing and wire bonding procedure at DESY

