



# Project on Large Hadron Collider Beauty (LHCb) Experiment

Supervisors

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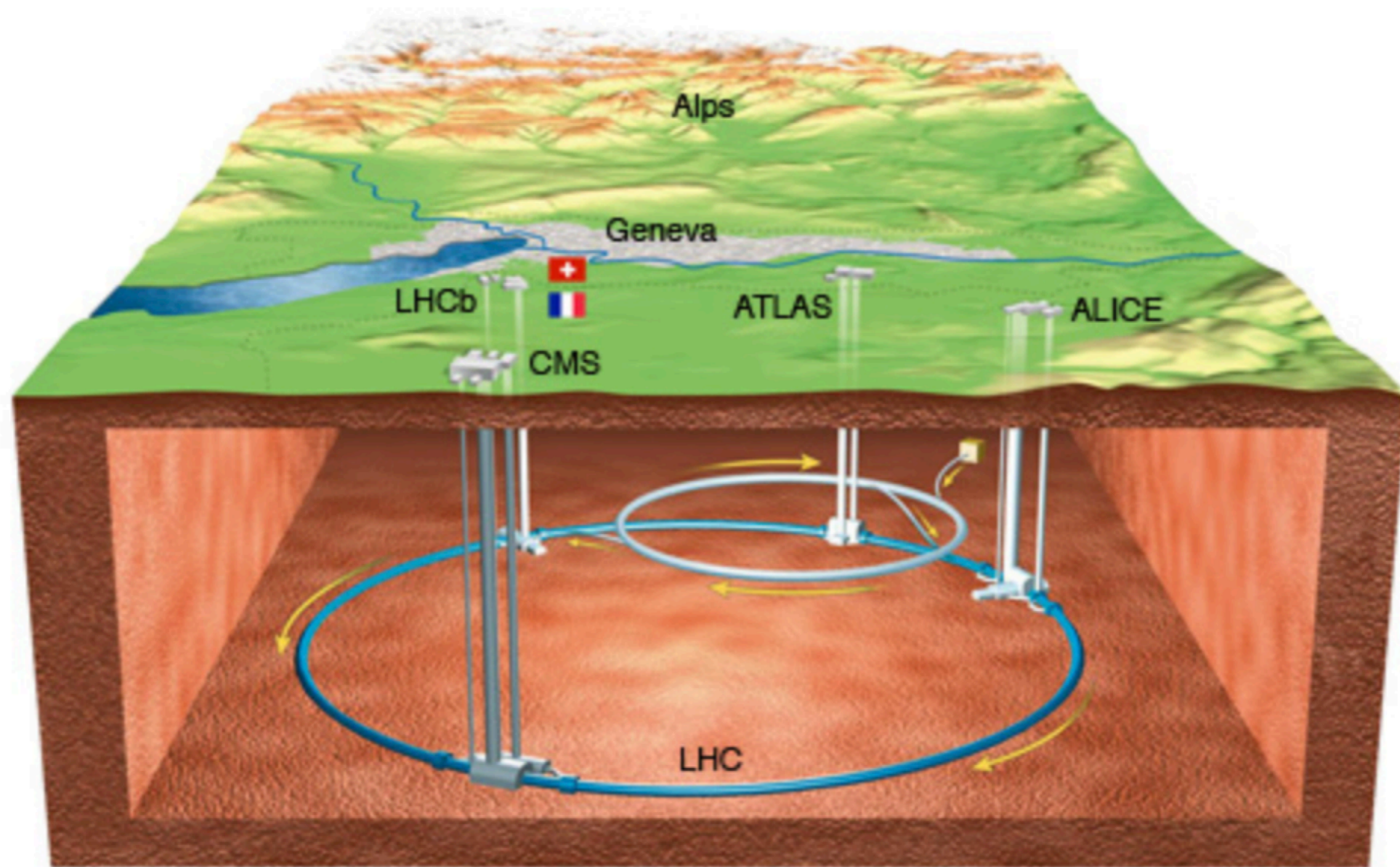
Science and  
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Particle Physics



The University of Manchester

# LHCb Experiment

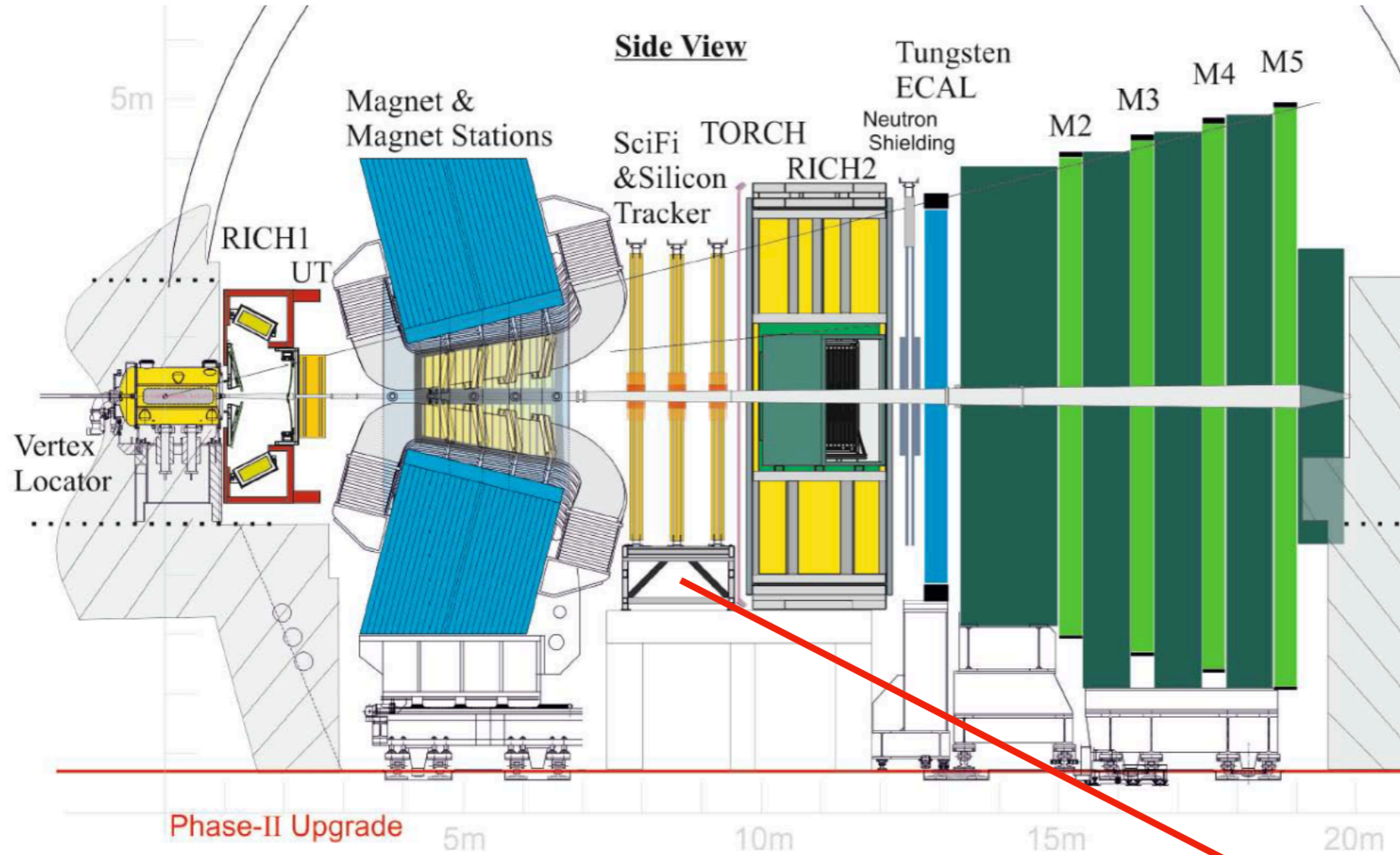


# PhD Project

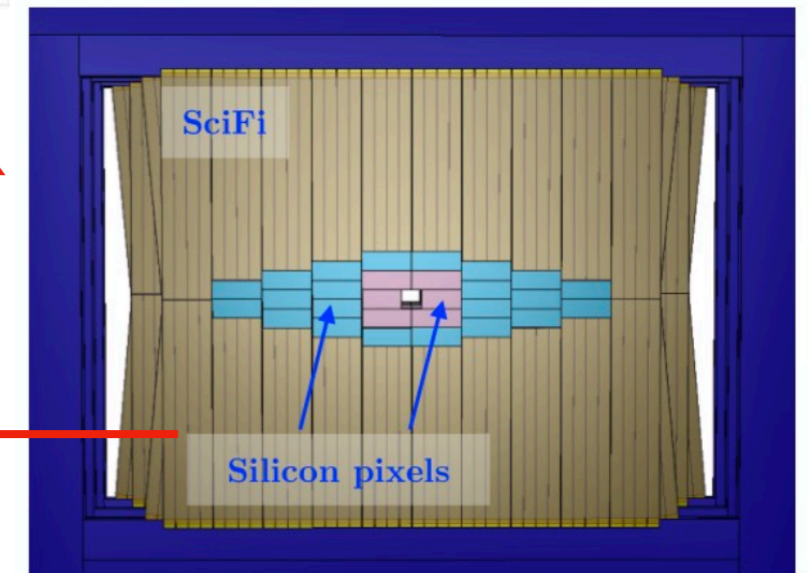
Idea is to have an equal split between the hardware and physics analysis

- ❑ Development of HV-CMOS (Monolithic Active Pixel) sensors for LHCb Upgrade II
- ❑ Flavour Physics: Search for New Physics using the LHCb Run3 data

# LHCb Tracker Upgrade

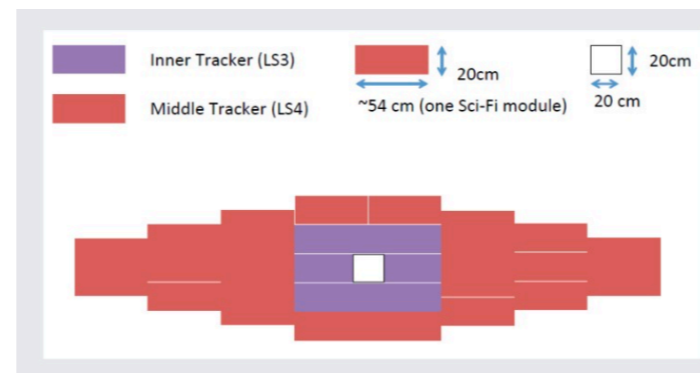
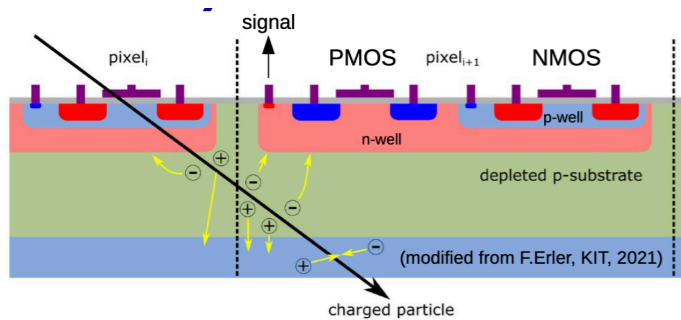


Mighty Tracker Front View



**~20 m<sup>2</sup> of silicon area**

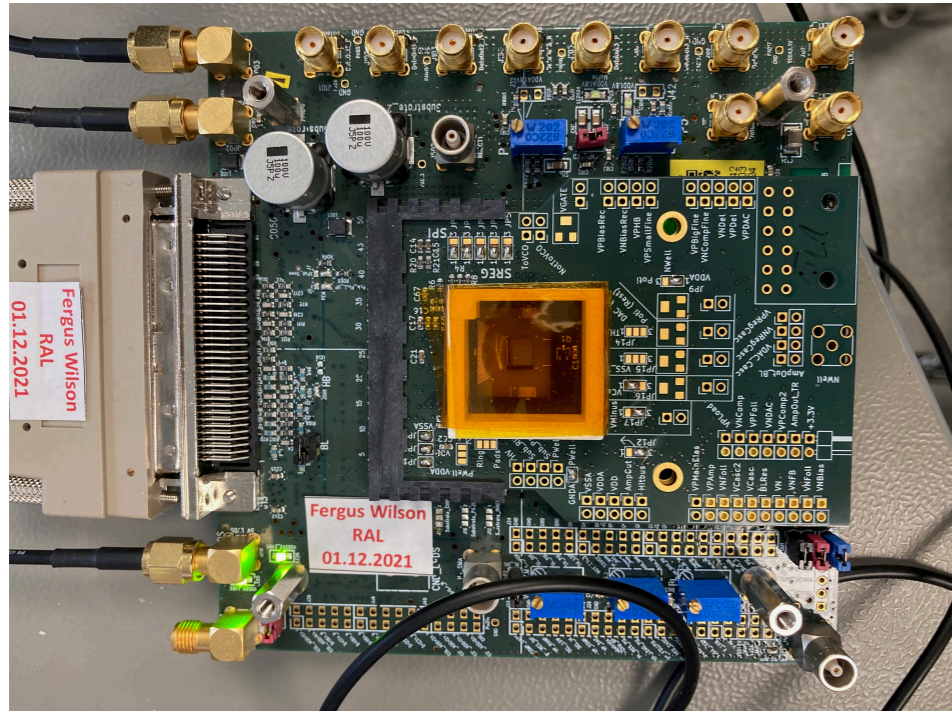
## Monolithic Active Pixels



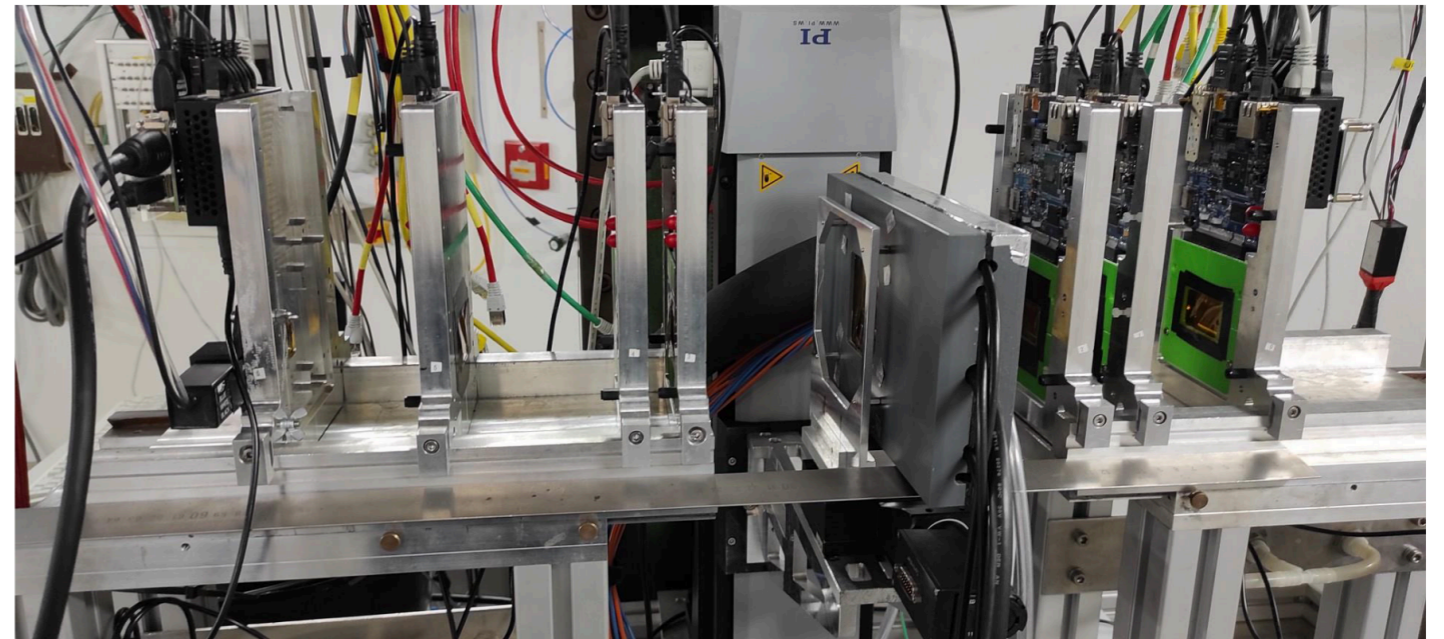
# Hardware Project

## R&D on Silicon Sensor

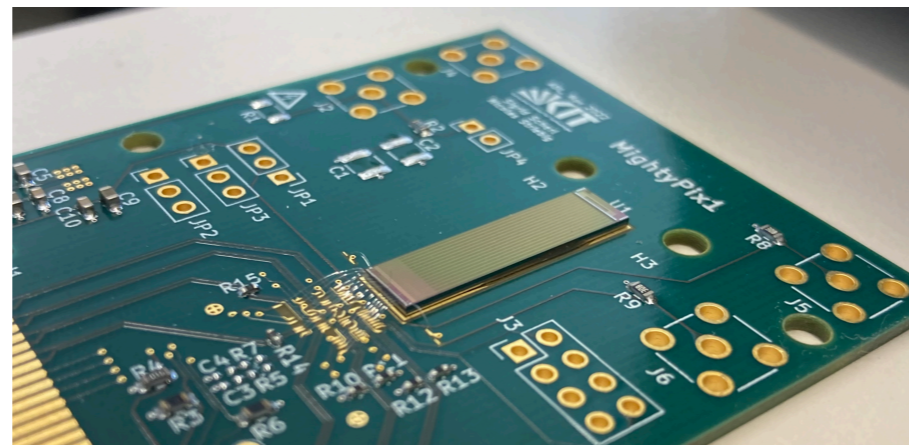
### Sensor Characterisation



### Participate in Test Beam



Sensor performance studies are crucial for the Technical Design Report for the Upgrade

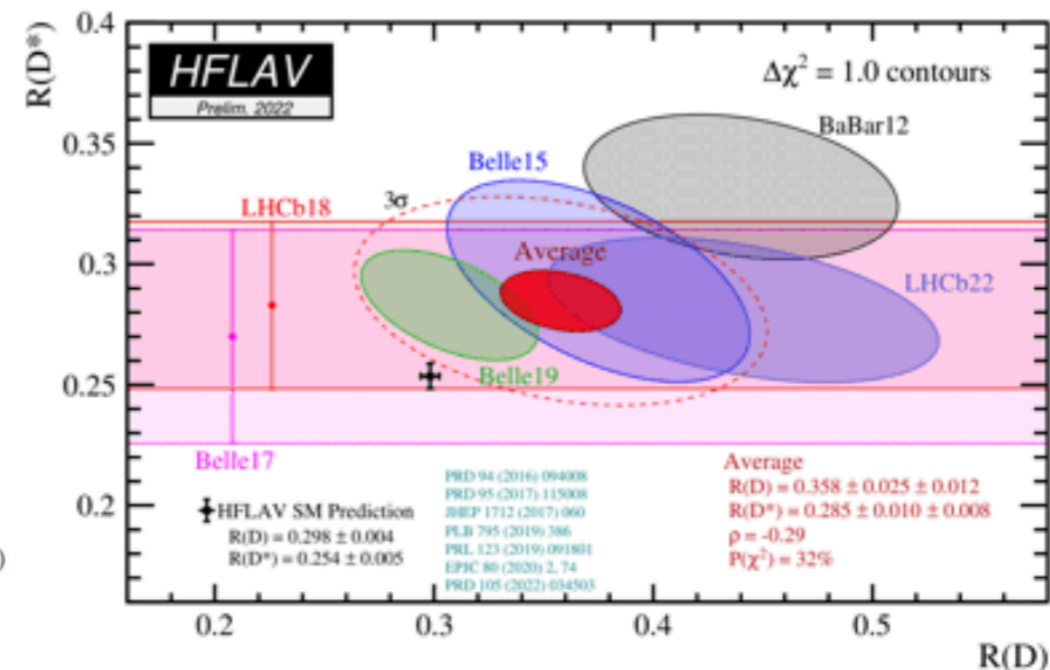
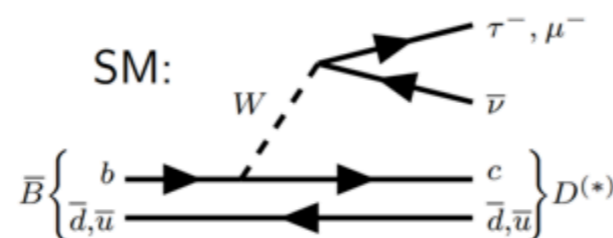


First version of the sensor

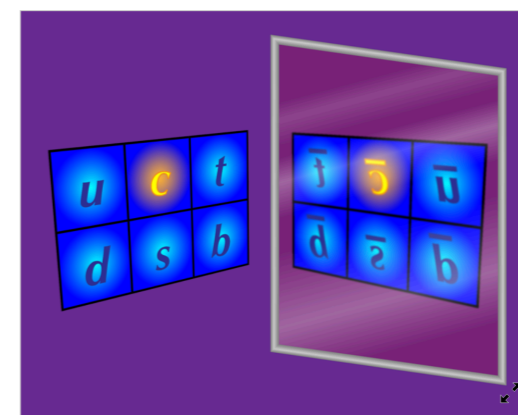
# Physics Analysis

Several available projects to choose from

- **Lepton Flavour Universality Violation**
  - World average differs by 3.2 standard deviation from Standard Model



- **CP-violation in the Charm sector**
  - Essential to explain matter-antimatter asymmetry
  - SM only able to explain fraction of the imbalance
  - LHCb observed first evidence in charm decays, measurement consistent with SM



- **Cross-section measurement with early Run3 data**

If you are interested in our project, drop by for a chat at **Room R 1.44**