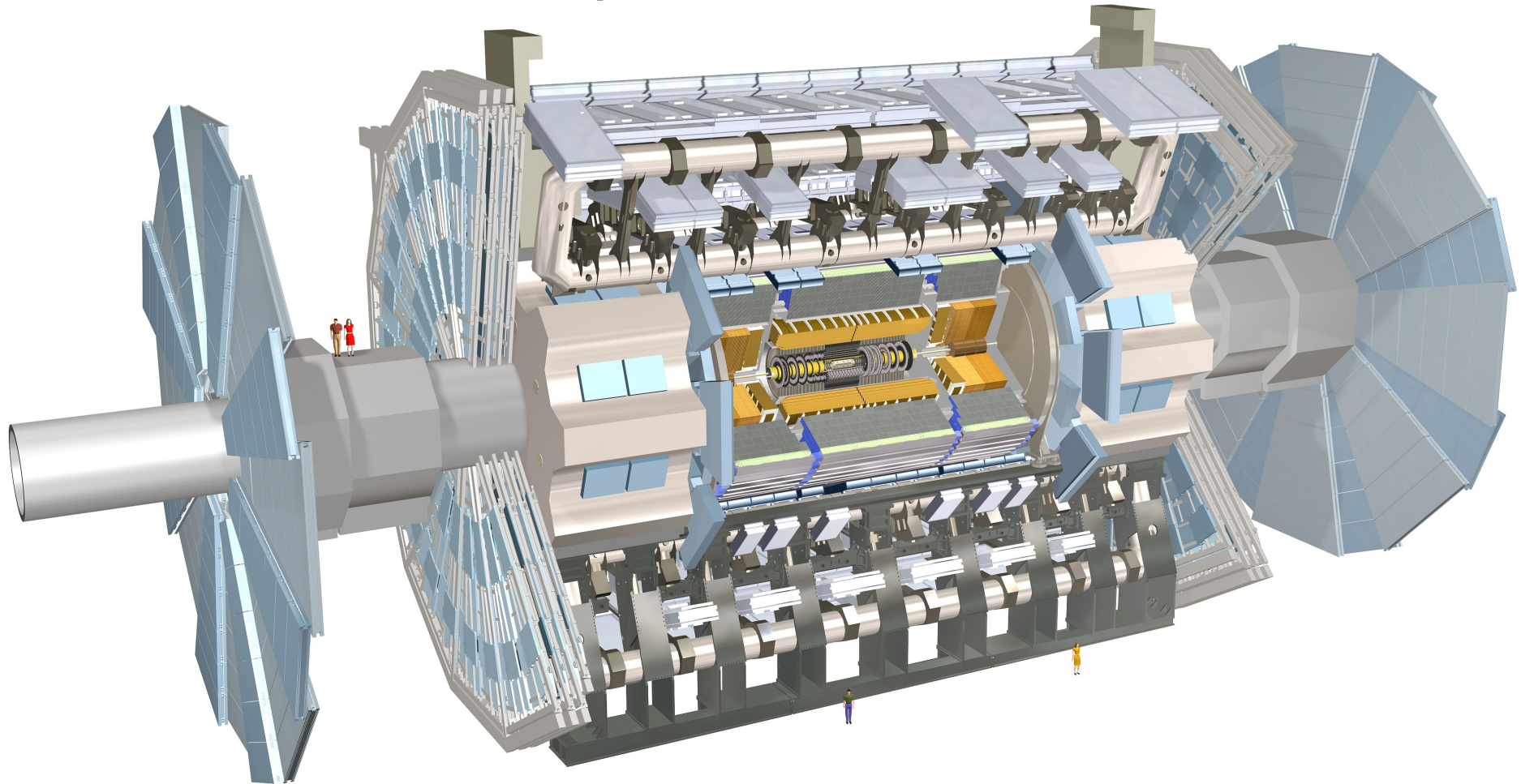


# Search for Supersymmetry with the ATLAS Experiment



Tobias Kruker  
Uni Bern

Search Channel:

Multileptons

# Multilepton Signatures

- Lepton = electron or muon
- Multi = 3 or more
- Why multileptons?
  - Why not?
  - Trigger
  - Physics: good sensitivity for in certain models

# Analysis Overview

- Apply cuts to separate signal (SUSY) from background (SM)
  - These cuts define the Signal Region
- Predict the background in the Signal Region
- Predict the signal from a given model in the Signal Region
- Compare the data to the predictions
  - Check if data is compatible with background
  - Exclude those signal models which are incompatible with the data

Method to estimate background:

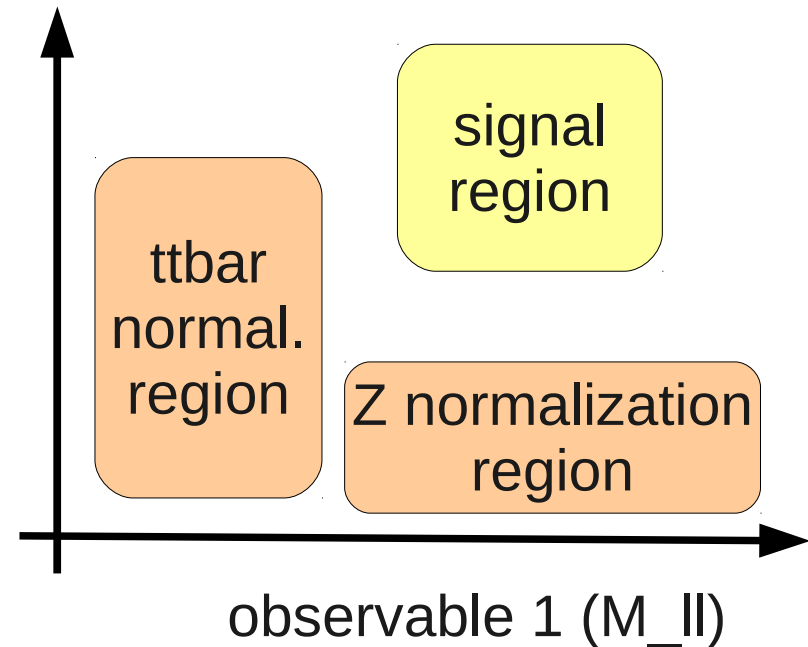
Scale Monte Carlo predictions to  
data (normalization)

and allow signal to be present in this  
process to avoid normalizing away a possible  
signal

# Analysis Method: Simultaneous Fit

- Apart from Signal Region define multiple „Normalization Regions“
- Use them to normalize the background => scale background prediction from Monte Carlo to what is seen in data
- Also allow signal to be present in Normalization Regions
- Perform a fit over all regions simultaneously

observable 2  
(MET)



**a semi-data driven background estimate in the signal region which takes signal contamination in background normalization regions into account**