April 27, 2023 (Week 13)
Experimental HEP Analyses

Objectives:

- Become familiar with steps involved in a HEP-ex analysis

Outline:

- Monte Carlo
- Data formats/flow
- Object selection
- Event selection/optimization
- Analysis regions
- Background estimation
- Evaluating uncertainties
- Statistical analysis
- Interpreting results
- ATLAS review procedure

Homework - due May 2, 2023:

1. Prepare/present slides about an ATLAS analysis
   - Sign up for 1 analysis here
   - Prepare slides:
     - Metadata - when was it finished, which dataset, where to find information, where is it published, which physics group, etc.
     - Theoretical motivation
     - List of signal samples and major backgrounds
     - Objects used
     - Event selection strategy
     - Signal, validation and control regions
     - List of systematic uncertainties
     - Statistical analysis
     - Results
   - You will be asked to present your analysis in class on May 2
2. Due May 4th: Submit any questions you have about work at CERN, life at CERN and in the Geneva area, or traveling around Europe: question sheet