



ESR4: Sofia Cella (CERN and University of Geneva)

SMARTHEP kick-off
November 21st, 2022



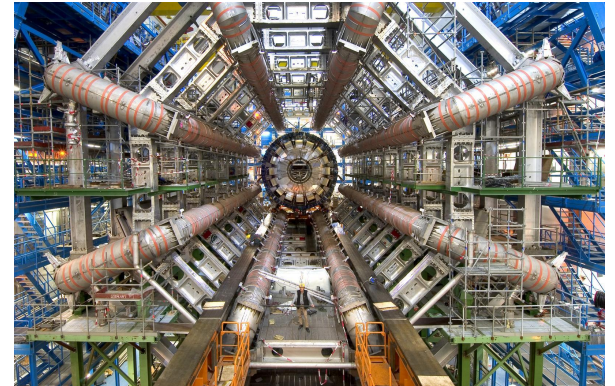
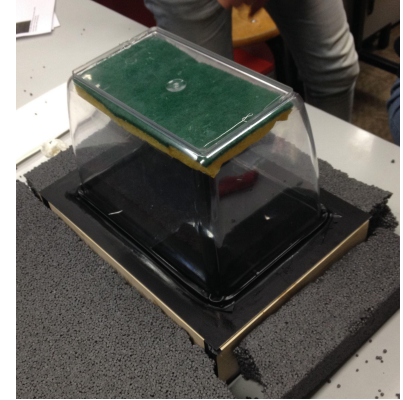
We acknowledge funding from the European Union Horizon 2020 research and innovation programme, call H2020-MSCA-ITN-2020, under Grant Agreement n. 956086



**UNIVERSITÉ
DE GENÈVE**

About me

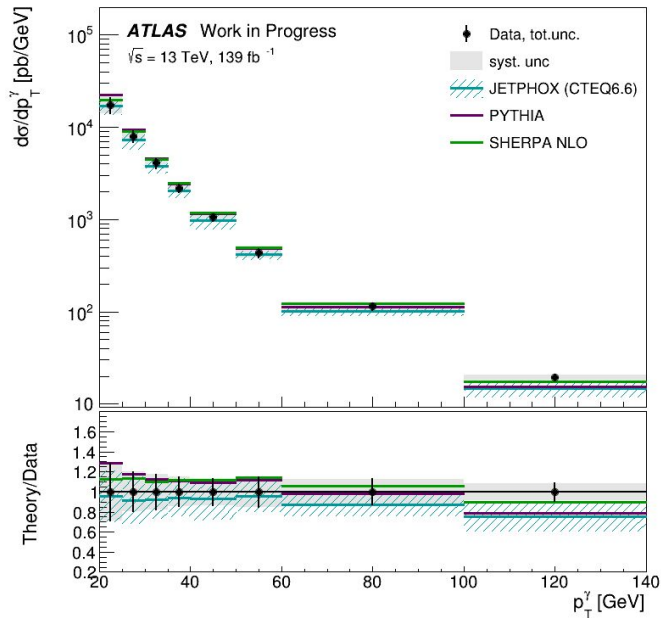
- From Gallarate (near Milan)
- Bachelor's and Master's Degree in Physics at the University of Milan
 - ATLAS Member since March 2021
- Academic studies in piano (Bachelor's level) at the Gallarate Conservatory of Music G. Puccini



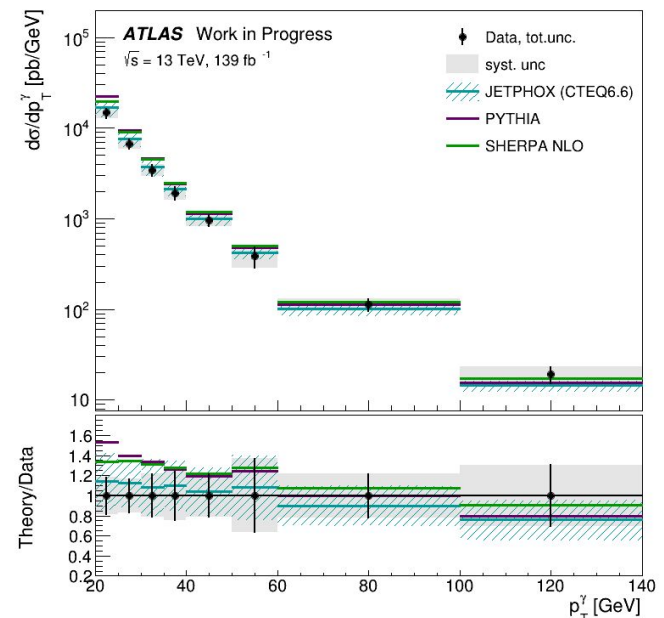
Master's Thesis Work

- Measurement of inclusive isolated-photon cross section with the ATLAS detector using the Frixione isolation prescription

Differential cross-section (Fixed-cone isolation)

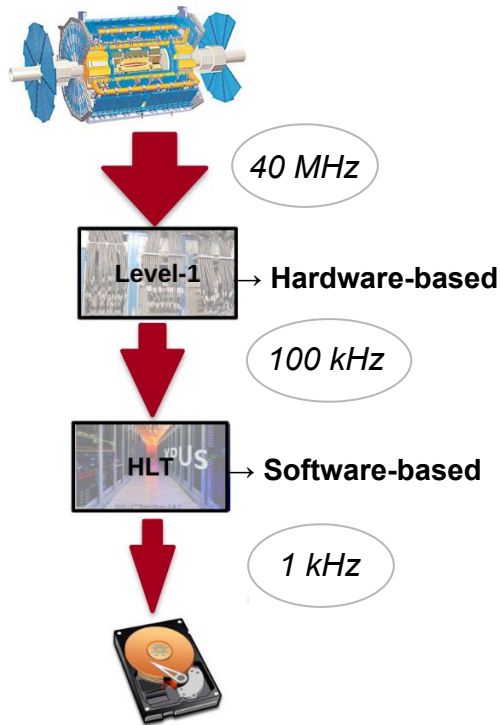


Differential cross-section (Frixione isolation)



Ph.D. : ongoing projects

ATLAS Trigger System:



- **ATLAS HLT Trigger**

- Rates and cost analysis
- Rulebook
- Trigger operations

Longer term:

- Secondment at Lightbox (Geneva)
- Contribute to physics analysis with the UniGe group

Ph.D. : ongoing projects

- **Trigger Rates and Cost analysis**

- The study of Rates and Cost allows to predict the needed resources
- Enhanced Bias (EB) data: interesting events are generally rare → events which are likely to be selected by the trigger are overweighted
- Trigger re-executed on the events in the EB sample (1M) to study Rates and Cost

→ Optimize existing algorithms or try new ones (e.g. ML)

- ML for efficient deployment on trigger

- **Rulebook**

- Event selections in HLT: sequence of selection steps, called *chains*
- Collection of all the trigger chains: *trigger menu*
- Chain with *prescale* n : $1/n$ probability of activating when seeded

→ the *Rulebook* is a package used to create prescale sets

- **Trigger Operations**

- Shifts in the ATLAS Control Room:

Trigger desk: provide trigger configuration, monitor trigger rates

Run control desk: start and stop the runs, change system configuration

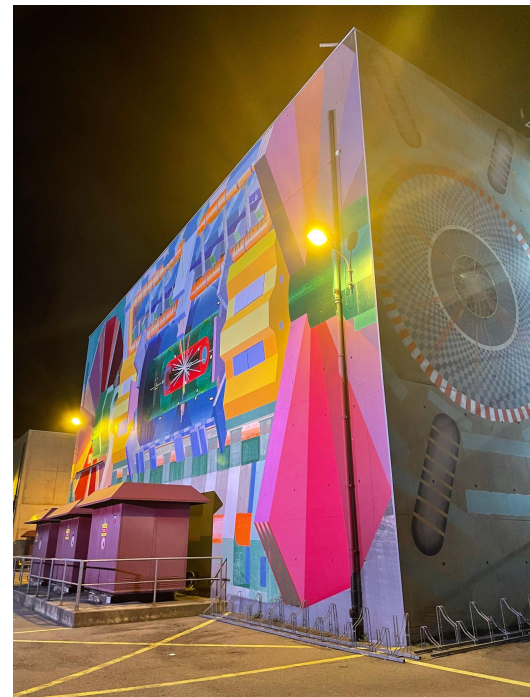
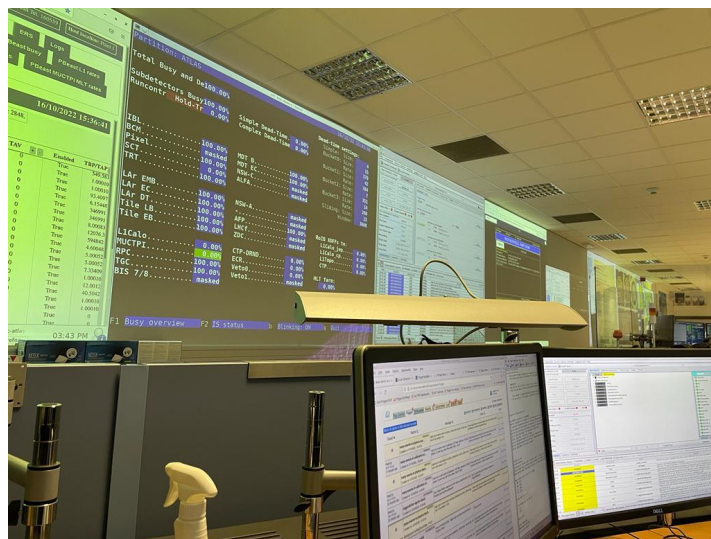
- Trigger Offline Reprocessing Expert:

Validation of software releases rerunning trigger algorithms on EB data



ACR RC Shifts

- Some pics from my last (Night!) Shifts in the ATLAS Control Room at the Run Control desk



Hobbies

