

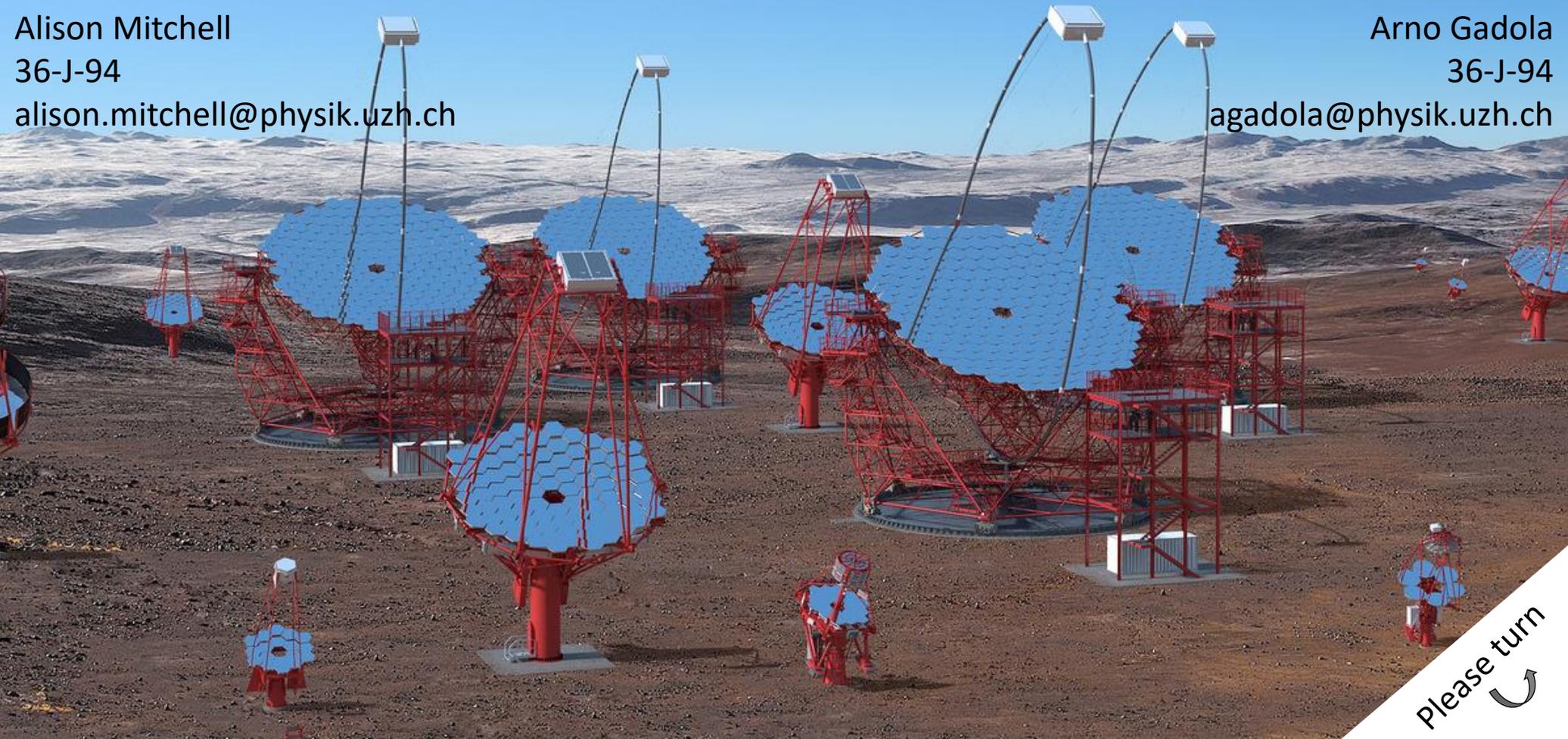
Bachelor and Master theses with the Cherenkov Telescope Array (Prof. Florencia Canelli)

We are looking for students who are interested in developing their skills in programming (Python) and in analysing data. With your skills you will look into data obtained with current telescopes and produced in simulations for CTA. Your analysis will help to better understand the physics of gamma-ray sources and the observation instruments we develop.

Drop a mail or come and talk to us. Own ideas are welcome and can also be pursued.

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Timing Calibration – Whose clock is right?

CTA will comprise several different telescope types, which use different trigger criteria. This can lead to systematic offsets between telescope types in the recorded time of a gamma-ray event. In this project, CTA simulations will be used to identify such systematic offsets and calibrate the telescope timings. The achievable precision will be characterised. The effect of such timing offsets on gamma-ray reconstruction will be investigated.

Gamma-ray Data Analysis with CTA tools

Recently, the H.E.S.S. experiment has made a public data release of real gamma-ray data from IACTs. In this project, publicly available CTA analysis tools will be used to analyse this data and results compared to previous publications. Efforts will be made to understand any differences and areas for further development of the current analysis tools identified. Participation in CTA data challenges is possible and welcomed.

Muon Hunting – One Ring (Fitting Algorithm) to rule them all

Muons generate distinct ring-like images in Cherenkov cameras and are used for calibration purposes. For CTA, good ring identification methods are needed to work on all telescope types. In this project, different ring identification methods will be implemented and tested on CTA simulations. The performance of different algorithms will be compared in order to determine the most suitable approach for CTA.